Summary

(Evaluation of Storage and Analysis Protocols for Environmental Water Samples Containing Ethanol)

Improved routine sampling and analysis methods are needed to meet the data quality objectives of future studies and groundwater resource management. A study was performed to evaluate the best storage and contract laboratory analytical protocols for environmental water samples containing ethanol and to make recommendations for improvement. This study found that:

- Ethanol in samples can be easily degraded and that care should be taken to preserve a sample as quickly as possible after sample collection.
- Refrigeration without preservation does little better than no preservation at all.
- Acidification of groundwater samples followed by refrigeration adequately preserves ethanol in groundwater samples for longer than two weeks.
- It is reasonable to expect that analytical laboratories should be able to achieve reporting limits of 50-500 *ppb* for ethanol in clean water. All commercial laboratories that were part of this study were capable of accurately detecting ethanol in clean groundwater at concentrations near their reporting limits.
- Reporting limits will be increased in the presence of interferences caused by other analytes, such as gasoline components. In this case, the actual reporting limits achievable will depend on analyst experience and the extent to which the sample must be diluted prior to analysis.
- To document the skill with which a contract lab handles complex samples, the individual submitting samples is encouraged to send known performance evaluation samples to the contractlaboratory.